Orchid Mycorrhizas - a disproportionate focus on the minutiae?

John Dearnaley

Australian Centre for Sustainable Catchments, The University of Southern Queensland, Toowoomba, QLD

Orchid mycorrhizas are symbiotic associations between fungi and members of the orchid family. The association has been particularly well studied over the last century and much has been learned regarding the anatomy, physiology and ecology of the interaction. Orchids are a significant global horticultural industry, as well, vanilla is a major crop species in tropical regions. Does this warrant the considerable research activity focussed on orchid mycorrhizas or is such study a disproportionate focus on the minutiae?

Increasing our understanding of the interaction between mycorrhizal fungi and orchids has merit for a number of reasons. With more than 25,000 species described, orchids represent a large portion of global botanical diversity. A significant number of orchids appear on world threatened species lists and a more complete understanding of the ecology of such taxa is needed for successful conservation work. Although orchids typically associate with the basidiomycete group of fungi there is considerable diversity in the fungal taxa involved. This now includes not only the well documented heteterobasidiomycete genera (eg. *Sebacina, Ceratobasidium*, *Thanatephorus*, *Tulasnella*), but also a wide cross section of higher basidiomycetes (eg. *Coprinus*, *Russula*, *Psathyrella*, *Inocybe*, *Campanella*). Investigation of these associations adds to basic biological understanding of the fungal taxa concerned, as well as completes a broader ecological picture. Recent research has demonstrated orchid mycorrhizas as a true mutualism, with the photosynthetic host providing carbon to its fungal partner in exchange for water and inorganic nutrients. There are two major implications of this. As the association is easy to study in the laboratory (both partners can be axenically cultured) compared to ectomycorrhizas and arbuscular mycorrhizas, orchid mycorrhizas could be used as a general mycorrhizal model. Orchids appear to have carbon inputs into the common mycelial network throughout soils and thus their contribution to ecosystem health should be recognised.

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